

to 70% by weight since this can avoid a problem of cure shrinkage or orientation failure of the liquid crystals caused by the increase of the ratio of other monomer ingredients, or a problem that the viscosity is excessively high or excessively low in a case of coating the sealing material by printing or the like.

[0028]

Further, it is preferred that the photoinitiator is the photoinitiator selected from the group consisting of the acetophenone type photoinitiators, benzoin type photoinitiators, and benzophenone type photoinitiators, since polymerization tends to proceed easily at a wavelength of a usual UV-lamps and there is no worry that the polymerization proceeds during preparation of the sealing material since such photoinitiators have long pot life. In a case where the blending ratio of the photoinitiator is excessively low, since the UV-ray curing does not proceed sufficiently, uncured ingredients leach into the liquid crystals to possibly cause a problem such as orientation failure of the liquid crystals. In a case where it is excessively high, radicals etc. formed from the excess photoinitiator etc. leach into the liquid crystals to give undesired effects on the current value of the obtained liquid crystal display device, etc. Accordingly, the photoinitiator preferably is contained within a range from 3 to 5% by weight in the liquid crystal sealing material.

[0029]

Further, the heat-curing agent is preferably a heat-curing agent selected from the group consisting of hydrazides, aromatic amines, acid anhydrides and imidazoles since such heat-curing agents have a curing temperature lower than the decomposition point of usual liquid crystals tending to cause less thermal degradation to the liquid crystals. Further, since such heat-curing agents have a long pot life, usually, a pot life of 8 hours or more, they are preferred in that the heat-curing agent is not decomposed during preparation of the sealing material.

[0030]

Further, it is preferred to define the heat-curing agent as a solid particulate heat-curing agent with an average grain size of  $3\text{ }\mu\text{m}$  or less since those of the solid particulate shape have a long pot life. Further, the average particle size is preferably defined to  $3\text{ }\mu\text{m}$  or less, since the average particle size is smaller than the gap of the two substrates of the liquid crystal panel adjusted by a spacer or the like and gives less undesired effects on the gap of the two the substrates of the liquid crystal panel. While there is no particular restriction on the lower limit of the average grain size of the heat-curing agent, it is usually about  $1\text{ }\mu\text{m}$ .

[0031]

Further, the silane coupling agent is preferably defined as the silane coupling agent selected from the group consisting of glycidyl ethoxy silane and glycidyl methoxy silane since it has high improving effect for the moisture